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## NOTES ON SOME NORTHWEST COAST ACMAEAS.

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Since Dr. Philip Carpenter's review of the Acmaeas of the Northwest Coast (*Am. Journ. Conch.*, II, 1866) all writers on the subject, including myself, have to a large extent, if not entirely, accepted his conclusions as to their nomenclature.

Having occasion to revise the magnificent series of these shells in the National Museum, I have recently reviewed the whole nomenclature from the beginning, and to my surprise and dismay found that Dr. Carpenter, in his desire to perpetuate the manuscript names of his friend Thomas Nuttall, had frequently ignored the rules altogether, had adopted names which he knew to be preoccupied, and in several cases misidentified early authors' species. Mr. Robson of the British Museum had intimated to me some time ago that the nomenclature of these limpets was in a very bad state of confusion, but until I came to work over them myself I had no realization of the true condition.

In extenuation it must be remembered that fifty years ago the necessity of strictly conforming to the rules was little appreciated, and many excellent naturalists of that day are responsible through their carelessness for much of the trouble now encountered.

In reviewing the work of an author who like Eschscholtz gave several names to mutations of the same species, the most acceptable way is to take his first name for the consolidated species and put the others in synonymy. Dr. Carpenter, however, in choosing in such

cases did not follow this method. However, as the first reviser, his selection may be considered final, or we should practically have to change all his names. In the space here available it is not practicable to give a full discussion, but the final results may be noted.

*Acmaea cassis* Eschscholtz, is a splendid form of *A. pelta* (Esch.) Cpr., and *A. fimbriata* Gould, is synonymous. *Acmaea pelta* Cpr., has five or six synonyms, and as tolerably distinct mutations includes *nacelloides* Dall; *monticola* pars (Nutt.) Cpr.; and *olympica* Dall (Pilsbry, Man., pl. 8, figs. 92, 93, 94).

*Acmaea patina* (Esch.) Cpr., has many synonyms, and, as recognizable mutations, *ochracea* Dall; *emydia* Dall (the Arctic *testudinialis* of my 1871 paper); *cribraria* (Gld.) Cpr.; and *parallela* Dall; the latter corresponding to the *A. alveus* of the Atlantic coast.

*Acmaea persona* Eschscholtz, is not Carpenter's *persona* (which is a mutation of *digitalis* Esch.) but is the shell Carpenter called *cumingii* in 1866; though not the same as the prior *cumingii* of Reeve. *A. persona* is a fine species, and I have a large series ranging from Alaska Peninsula to Socorro Island.

*Acmaea digitalis* Eschscholtz, is the northern form which merges into *unbonata* (Nutt.) Reeve, southward; and then into *textilis* Gould, at its southernmost range. Part of Gould's *scabra* of 1846 is the same as *textilis* Gld. + *persona* Cpr. (not Esch.) + *oregona* (Nutt. MS.) Cpr.

*Acmaea scabra* Gould, 1846 (from type), is the shell later named *spectrum* (Nutt. MS.) Reeve, and is generally known under the latter name, which of course must be discarded.

*Acmaea scabra* (Nutt. MS.) Reeve, 1855 (not of Gould, 1846), must take the earliest synonym, which seems to be *limatula* Cpr., 1866.

*Acmaea* var. *funiculata* Cpr., merges by imperceptible degrees into the later *tenuisculpta* Cpr., and that into *mitra* Eschscholtz.

*Acmaea persona* Esch. (not Cpr.), merges southward into *strigilata* Cpr.

*Acmaea semirubida* Dall, resembles *triangularis* Cpr., but is more oval in outline, with crimson rays on a white ground; it ranges from the Gulf of California to Panama.

*Scurria aeruginosa* (Midd., 1847, as *Patella*, with a wrong habitat) is an earlier name for the shell generally known as *mesoleuca* Menke, 1851, from the Gulf of California.

In studying these mollusks it is necessary to remember that the different species often have an almost identical series of color variations, so that if one is guided chiefly by color, there is a liability to put together mutations belonging to different species. There is little doubt that food greatly influences and directly changes both the color and texture of the outer layers of the shell, while the form is directly related to the situs of the individual.

An interesting fact in the distribution of these animals is the evidence they give in favor of the probability of the former existence of an elevated ridge or range roughly parallel with the coast of California and the peninsula, and of which the Santa Barbara Islands, Guadelupe, and Socorro are the only supermarine indications at the present day. It looks as if there was a second gulf or inlet between this range and that of Lower California, so that the cool-temperate species were able to extend as far south as Socorro on the western coast of the western range, while the more tropical forms were able to reach far to the North in the warmer waters of the inner area between the outer range and the continent to the east of it, including what is now the Gulf of California.

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#### POSTPLIOCENE SHELLS OF PROVIDENCE AND LUPUS, MISSOURI.

BY F. A. SAMPSON.

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Several trips to these two places have given many specimens. Providence, Boone County, is on the north side of the Missouri river, a place now of only a few houses, but formerly, in the days of steamboat travel on the river, a large town and important shipping point. The grading for the Missouri, Kansas and Texas railroad along the river cut into the bluffs, and uncovered the deposits containing great numbers of postpliocene land shells. The deposit is of later period than the Kansas loess, and is not the fine silt of the loess, but is of clay intermixed with stones of various sizes.

Lupus is almost opposite on the other side of this river, in Moniteau County, where the grading for the river route of the Missouri Pacific railroad uncovered the beds with the fossil shells. A mile above Lupus was the former town and steamboat landing of Mt. Vernon, a town of which no trace now remains. On both sides of the river the rocky bluffs are of Chouteau limestone, resting on beds